

## **ABSTRACT: Cosun Beet Company**

### **Sugar beet as a sustainable source of inspiration for innovation in biobased chemicals and materials. Galactaric acid a novel biobased corrosion inhibitor based on sugar beet pulp.**

Europe's economy depends on oil and gas for the chemicals and energy sectors and for all kinds of everyday products. However, fossil resources are becoming scarce and their use harms the environment and our climate. Bio-based products can substitute fossil-based materials and bring new functionalities to the market, making the economy more sustainable, circular and reducing its dependence on fossil resources. Sugar beet is locally available and it is an important source of renewable carbon in the transition towards a fully renewable chemicals and materials sector in Europe.

The main strength of sugar beet is its very high land efficiency (low LCA). No other biomass can produce more directly convertible sugar per hectare. Cosun Beet Company has a long tradition of using every part of the sugar beet to produce a wide range of products in addition to table sugar. Other applications include food ingredients, animal feed, and renewable ethanol and biogas. Cosun Beet Company is now also developing biobased based chemicals and materials based on sugar beet pulp.

### **Sugar beet pulp refining**

Sugar beet pulp accounts for approx. 13 million tons in Europe and is a major residual stream from the sugar beet industry, which is currently valorized as feed and/or green gas. Cosun Beet Company is developing an integrated and cost-effective biorefinery system to refine sugar beet pulp. Within this concept, it was demonstrated to isolate cellulosic fibers, pectin and different monosaccharides.

#### Galactaric acid (main use in anti-corrosion)

This presentation will zoom in on the platform molecule Galactaric acid one of the key monosaccharides in sugar beet pulp is Galacturonic acid. Using mild processing conditions, galacturonic acid can be isolated and selectively oxidized (a novel process) to Galactaric acid (commercial name Mucic acid). This stable molecule has multiple outlets, including a corrosion inhibitor (novel application). It offers unique functionalities and shows distinguishing results to aluminium. In external tests, it shows equal or better performance to commercial fossil benchmarks. The adhesion of the inhibitor is in line with international standards and contributes to coating adhesion as well.

Cosun Beet Company also have other number of product developments in the pipe line.

#### Cellulosic fibers & Pectin (main use in Home Care and Personal Care)

Betafib®MCF is a 100% natural biopolymer (cellulose) and is COSMOS and ECOCERT certified. We've designed it to help stabilize formulations, modify rheology, and suspend (encapsulated) particles. The liquid sides stream pectin was commercialized this year as a natural counterpart of Polyacrylates. An added value was demonstrated in leather treatment.